



## PELVIC HIP POSITIONER FOR A WHEELCHAIR SEAT

### Cross-Reference to Related Applications

Not Applicable

### Statement Regarding Federally Sponsored Research or Development

Not Applicable

### Background of the Invention

#### 1. Field of the Invention

[0001] The present invention relates to wheelchairs, and more particularly to the seat of the wheelchair.

#### 2. Description of the Related Art

[0002] Wheelchairs are commonly used by people who are unable to walk. The typical wheelchair has tubular metal frame with large rear wheels at each side and smaller front wheels which swivel. In its simplest form, the seat of the wheelchair comprises a sheet of material which is hung between two horizontal arms of the frame and a similar vertical sheet of material that is strung between two vertical rear posts. Although the flexible sheets of material conform somewhat to the contour of the user's body, this type of seat is not very comfortable for users who remain in the wheelchair for prolonged periods of time. Therefore, it is very common for the horizontal and vertical sheets to be replaced with after market seat cushions

[0003] For persons requiring lateral support in order to maintain their posture when seated, side pads also are attached to the wheelchair seat. For example, pads commonly are placed low on each sides toward the back of the seat to support the user's hips. However, such side pads do not offer frontal stability or overall pelvic control.

[0004] For greater frontal stability, seat belts have been incorporated on wheelchairs to secure the occupant's hips and prevent the user from sliding forward off the seat. A seat belt does not offer lateral support and can dig into the user, thereby being extremely uncomfortable and adversely affecting blood circulation.

[0005] Rigid curved bars with cushioned sleeves, such as the ones shown in U. S. Patent No. 4,813,746, have been adjustably mounted on a wheelchair to support the pelvic region of the user.

[0006] Nevertheless, there still exists a need for a comfortable, easy to utilize pelvic support for wheelchair occupants.

#### Summary of the Invention

[0007] A hip control apparatus is provided for a wheelchair that has a frame with a seat attached thereto. That apparatus includes a first hip support and a second hip support for attachment on opposite sides of the wheelchair seat. The first hip support has a main section with a resilient pad. A flexible first arm extends from the main section toward the front of the wheelchair and a first fastener for attachment to one of the seat and the frame. The second hip support has a main section from which a resiliently flexible second arm extends

toward the front of the wheelchair and a second fastener for attachment to one of the seat and the frame.

[0008] A seat belt has a first section attached to the first hip support and a separate second section attached to the second hip support. A connector secures the first and second sections together. Securing the first and second sections with the connector causes the first and second arms to bend about a person seated in the wheelchair. Upon releasing the connector and separating the two seat belt portions, the first and second arms return to unbend positions enabling the person to exit the wheelchair.

[0009] The seat belt ensures that the person can not slide off the seat. The resiliently flexible arms of the two hip supports bending about the seated person, upon fastening the seat belt, further supports the pelvic region of the wheelchair user.

#### Brief Description of the Drawings

[0010] FIGURE 1 is an isometric front view of a wheelchair with a seat having a hip support apparatus according to the present invention;

[0011] FIGURE 2 is a top view of a hip support on one side of the wheelchair;

[0012] FIGURE 3 is an exterior side view of the hip support;

[0013] FIGURE 4 is a top view of the hip support with the cover removed;

[0014] FIGURE 5 is a side view of the hip support with the cover removed; and

[0015] FIGURE 6 illustrates the hip support apparatus with a person seated in the wheelchair.

#### Detailed Description of the Invention

[0016] With initial reference to Figure 1, a wheelchair 10 has a tubular metal frame 12 that includes a pair of vertical posts 14 and 15 and two horizontal members 16 and 17. A seat 18 of the wheelchair comprises a bottom cushion 19 attached to the horizontal members 16 and 17 and a back cushion 20 mounted on the vertical posts 14 and 15.

[0017] A hip control apparatus 30 comprises first and second lateral hip supports 32 and 34 which are attached on the right and left sides of the seat. Each hip supports 32 and 34 is attached to the seat back 20 or one of the vertical posts 14 or 15 and projects toward the front of the wheelchair. The first and second hip supports 32 and 34 are mirror images of each other, with the exception of the connector on a seat belt, as will be described. Figures 2 and 3 illustrate the details of the second, or left, hip support 34. That hip support has a body 36 formed by a generally circular main portion 38 located toward the rear of the seat 18 and from which an elongated, resiliently flexible arm 40 extends forwardly. Both the main portion 38 and the arm 40 are enclosed by a cover 42. Preferably the cover 42 has an inner half formed of a fabric and an outer half made of a vinyl with a seam there between.

[0018] The cover 42 encloses an internal structure shown in Figures 4 and 5. The second hip support 34 has a plate structure 43 formed by a primary plate 44 and a

secondary plate 46. The primary plate 44 has the same shape as the hip support and extending through the main portion 38 and the arm 40. A narrower arm section 48 of the primary plate 44 is located in the arm 40 and can flex inward and outward with respect to the wheelchair seat 18. The circular secondary plate 46 is bonded to the circular portion 47 of the primary plate 44, thereby adding rigidity to that circular portion. The secondary plate 46 may be of the same material as the primary plate 44 or it may be a more rigid material, in either case, the secondary plate when combined with the primary plate prevents significant deflection of the main portion 38 of the hip support 34. Although embodiment of the hip support shown in the drawings has the secondary plate 46 mounted to the interior side of the primary plate 44, the secondary plate could be on the exterior side of the primary plate.

**[0019]** A pad 50 of a resilient material, such as a cell foam commonly used in seat applications, is located on the inner side of the second hip support 34. The pad 50 is formed by a circular section 51 and an elongated section 52. The circular section 51 is adhered to the exposed major surface of the secondary plate 46. The thinner second pad 52 is adhered to the interior surface of the arm section 48 of the primary plate. An L-shaped mounting bracket 54 is secured to the two plates 44 and 46 by a pair of machine screws 56 which pass through slots 58 in a short leg of the bracket. The longer leg of the L-shaped bracket 54 is located against the rear surface of the seat back 20 in Figure 1 and is secured either to that seat back or to a bracket mounted on the adjacent vertical post 15 of the wheelchair frame 12. The longer leg of the bracket 54 has a pair of horizontal slots through which two machine screws pass to secure the hip support 34 to the wheelchair 10 in an

adjustable manner. The two machine screws 56 secure the bracket 54 to the plates are offset horizontally, thereby enabling the bracket to be pivoted so that the second hip support 34 can tilt up or down to accommodate the torso of the wheelchair user.

**[0020]** Referring again to Figure 1, the hip control apparatus 30 includes a seat belt 60, that has two segments 62 and 64 each attached to a different hip support 32 or 34 in identical manners. The details of the seat belt attachment to the second hip support 34 are shown in Figures 2 and 3. Specifically, an anchor 66 is bolted through the cover 42 to the primary plate 44 in a way that allows the anchor to pivot and enable adjustment of the seat belt length. The anchor 66 has a pair of vertical slots through which the associated left segment 64 of the seat belt 60 is looped in a conventional manner, so that pulling upon the belt, tightens the loop. The left seat belt segment 64 passes through a guide 68 secured to the outer side of the arm 40 of the second hip support 34.

**[0021]** The portion of the left seat belt segment 64 that extends beyond the end of the arm 40 is fastened to one component 70 of a conventional buckle. The right segment 62 of the seat belt 60 has one end attached to the right hip support 32 in the identical manner and another end fastened to the mating buckle component 72.

**[0022]** Referring again to Figures 1 and 6, a person 80 upon sitting in the wheelchair 10 grabs the two segments 62 and 64 of the seat belt 60 in each hand and brings them together across his or her lap. In doing so, the two arms 48 of each lateral hip support 32 and 34 bend across the lap of the person, thereby providing frontal, as well as lateral, support for the pelvic region of the wheelchair user. The person 80 then attaches the two components 70

and 72 of the buckle to secure the seat belt segments 62 and 64 together. Because the arms 40 of the hip supports 32 and 34 have only the primary plate 44 (Figure 4) extending there through, the flexible characteristic of that plate allows the arm to bend around the hips of the wheelchair user. In contrast, the circular main portion 38 of each hip support 32 and 34 has a base formed by the primary and secondary plates 44 and 46, thus being more rigid and less flexible, to resist bending against the sides of the user's hips.

[0023] When the person 80 wishes to leave the wheelchair, the two components 70 and 72 of the belt buckle are separated and the arms 48 are allowed to spring back to the illustrated linear position, thereby retracting the first and second hip supports 32 and 34 from around the waist of the user so that he or she may exit the wheelchair.

[0024] The foregoing description was primarily directed to a preferred embodiment of the invention. Although some attention was given to various alternatives within the scope of the invention, it is anticipated that one skilled in the art will likely realize additional alternatives that are now apparent from disclosure of embodiments of the invention. Accordingly, the scope of the invention should be determined from the following claims and not limited by the above disclosure.